REMARKS

Claims 1-14 and 17-22 are pending in this application. In response to the Office Action dated September 9, 2003, claims 11-14 have been amended. Care has been exercised to avoid the introduction of new matter. Indeed, adequate descriptive support for the present Amendment is apparent throughout the originally filed disclosure and claims. Applicants submit that the present Amendment does not generate any new matter issue.

Claims 11-14 were objected to under 37 CFR 1.75(c), as allegedly being of improper dependent form for failing to further limit the subject matter of a previous claim. Specifically, the Examiner stated that claims 11-14 broaden the scope of claims 3 and 4 and suggested recasting these claims in independent form. Claims 11 and 13 have been recast in independent form and claims 12 and 14 have been amended to depend from claims 11 and 13, respectively. Accordingly, the Examiner is requested to reconsider and withdraw the objection over claims 11-14.

Claims 11-14, 17 and 18 were rejected under 35 U.S.C. § 112, second paragraph. Applicants respectfully traverse the rejection in view of the arguments and amendments.

The Examiner asserted that it is unclear what the formulas of claims 3 and 4 encompass if the composition of x is "within ± 5%" according to claims 11-14. As noted above, claims 11 and 12 have been recast in independent form and no longer depend from claims 3 and 4. Accordingly, Applicants submit that the rejection is moot.

The Examiner asserted that claims 17 and 18 were incomplete for allegedly omitting essential elements. Specifically, the Examiner stated that claims 17 and 18 do not define elements e or f and, further asserted that if z is a substitution quantity of M' then the general formula should be amended accordingly. Applicants traverse.

Applicants stress that the Examiner has failed to offer any reasoning as to why one having ordinary skill in the art would have had difficulty understanding Applicants' claimed invention. For this reason alone the rejection is not viable. Moreover, claims 17 and 18 each recite that element e or f is a natural number ranging from 1 to 30, with e < f. Thus, the claims clearly define these elements and one having ordinary skill in the art would not have difficulty understanding the scope of the presently claimed invention, particularly when reasonably interpreted in light of the supporting specification. Further, with respect to z, as discussed at page 11 of the specification, a part of the substitution metal M' can be substituted for one of the typical metal element or the transition metal element excluding Mn, Cr and Co, or for a metal M" in accordance with any combination of the above-described metal elements. In this case, the formula (C) can also be represented by the following formula $Li_{1-x}Mn_{1-y}M'_{y(1-Z)}M''_{yz}O_{2-\delta}$, wherein z is a M'-substitution quantity, and is preferably a rational number. When z is represented as e/f, desirably, e and f are natural numbers ranging from 1 to 30 and also satisfy e < f. Applicants submit, therefore, that one having ordinary skill in the art would not have difficulty understanding the scope of the presently claimed invention, particularly when reasonably interpreted in light of the supporting specification. The Examiner provided no arguments to justify why one having ordinary skill in the art would have had difficulty understanding Applicants' claimed invention. Therefore, it is respectfully submitted that the imposed rejection of claims 17-18 under 35 U.S.C. § 112, second paragraph is not legally viable and hence, solicit withdrawal thereof.

Claims 1-14, 19-22 were rejected under 35 U.S.C. § 102(e) as being anticipated over Dahn et al. (U.S. Pat. No. 6,168,887, hereinafter "Dahn"). Applicants respectfully traverse the rejection for the reasons set forth *infra*.

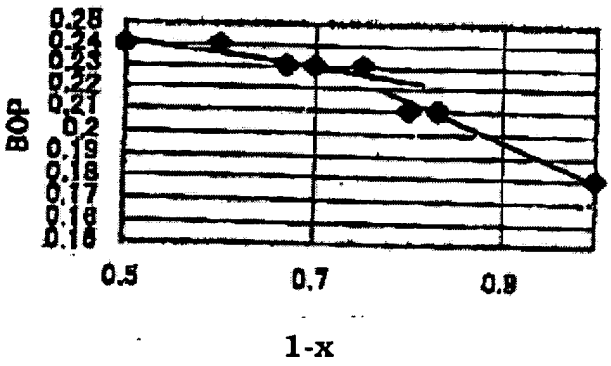
The Examiner asserted that Dahn inherently teaches the limitation of a BOP value of more than or equal to 0.23 because it is a property of the layered lithium manganese oxide material. The Examiner stated that Dahn teaches the same layered lithium manganese compound as disclosed in the claimed invention. Applicants respectfully traverse. It is well settled that inherency requires certainty, not speculation. *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc., 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 20 USPQ2d 1746 (Fed. Cir. 1991); In re Oelrich, 666 F.2d 578, 212 USPQ 323 (CCPA 1981).* Accordingly, when invoking the doctrine of inherency, the Examiner is obliged to point to a bases in fact and/or cogent technical reasoning to support the factual determination that the allegedly inherent feature necessarily flows from the teachings of the applied prior art. *Finnegan Corp. v. ITC, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); In re Robertson, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999).* It is respectfully submitted that this burden has not been discharged for the reasons set forth below.

Dahn discloses a layered lithium manganese oxide, represented by $Li_x(Mn_{1-y}M_y)O_{2+z}$, wherein M may be a 3d transition metal such as Ni, Co, Fe, Cr, or mixtures thereof, and $0.5 < x < 1.3$, $0.0 < y < 0.4$, and $-0.5 < z < 0.5$. See col. 3, lines 25-45. If Li_x is rewritten as Li_{1-x} to be consistent with the manner of expression of the present invention, Dahn discloses $0.5 < 1-x < 1.3$, that is, $-0.3 < x < 0.5$.

Independent claims 1, 11, 13 and 21-22, each recites in pertinent part, that the positive electrode active material includes the layered lithium manganese compound having a bond overlap population (BOP) value that is more than or equal to 0.23 and $1/5 < x$ (i.e. $0.2 < x$). It is noted that independent claim 22 further recites the value of $1/5 < x < 1/2$ (i.e. $0.2 < x < 0.5$). In contrast, Dahn neither teaches nor suggests a BOP value or the x value of > 0.2. A range of -0.4

to 0.5 is not consistent with a range of more than 0.2. Dahn discloses $-0.3 < x < 0.5$ (i.e. $0.5 < 1-x < 1.3$), however, the present inventors have discovered that a value of BOP is more than 0.23 even if x is more than 0.5 (i.e. $1-x < 0.5$). For instance, when x is more than 0.5, a lithium-deficient quantity is larger than a lithium-deficient quantity recited in the present claims and, therefore, a bonding power between metal elements and oxygen elements is strong as compared with the claimed invention. As a result, it is believed that a BOP becomes higher when x is more than 0.5. The Examiner's attention is directed to Figure 1 of the present specification, wherein the layered lithium manganese compound is formed of a repeating structure comprised of a metal layer, such as a Mn layer, an oxygen layer, a Li layer and another oxygen layer. A BOP is an index for an evaluation of a bonding strength between the Li layer and oxygen layers, which are placed above and below the Li layer, respectively. When the lithium-deficient quantity becomes larger, an amount of electrons the Li layer and oxygen layer hold in common is reduced and an amount of electrons that the metal layer and oxygen layer hold in common is increased. Accordingly, the bonding strength between metal layers and oxygen layers is improved and, therefore, the value of BOP increases. Therefore, even if x is more that 0.5 (i.e. $1-x < 0.5$), a value of BOP satisfies the conditions of $BOP > 0.23$. In contrast, the layered lithium manganese compound of Dahn that satisfies the range of $-0.3 < x < 0.5$ (i.e. $0.5 < 1-x < 1.3$) is not consistent with a layered lithium manganese compound that satisfies the range of $BOP > 0.23$.

Moreover, for the Examiner's convenience the following graph is presented which illustrates a relationship between BOP and "1-x" values based on the table of Figure 5 of the present invention.



As described in the table of Figure 5 and illustrated in the graph above, when x increases, a value of BOP is changed around where BOP is 0.23 or "1-x" is 0.8 (i.e. x = 0.2). When BOP is more than 0.23 or "1-x" is less than 0.8 (i.e. x < 0.2), the changing rate of BOP is small. In other words, a crystal structure is stable when BOP is more than 0.23 or "1-x" is less than 0.8 (i.e. x < 0.2). Dahn does not teach or suggest the critical point of BOP or x. Therefore, Dahn does not inherently disclose the claimed BOP value and as such, fails to identically disclose each element of the claimed invention.

Further, as is discussed at page 8, lines 8-19 of the specification, if a BOP value is high, it can be determined that the change in the crystal structure due to a thermal history is small, that is, the stability of the layered lithium manganese compound of the Li deficient type is high. For example, when the Li-deficient quantity x is larger than 1/5 (as in claims 1 and 21), a high BOP value can be obtained and the structure stability due to the Li deficiency can be secured. When the Li-deficient quantity x is larger than 1/2, the Li-containing quantity in the molecular crystal becomes undesirably smaller than that of the prior art's spinel type $LiMn_2O_4$. See specification at page 9, lines 5-27. Moreover, the Examiner's attention is directed to the comparative data of the present specification, depicted at Figures 5-7 and 10, which clearly supports the claimed relationship between the BOP value and the Li-deficiency. In contrast with the present

invention, Dahn fails to disclose or remotely suggest the claimed BOP value. Therefore, the references fail to disclose every limitation of the present claims. Thus, the rejection is not valid and should be withdrawn for at least these reasons.

Claims 17-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dahn et al. (U.S. Pat. No. 6,168,887). Applicants respectfully traverse the rejection for substantially the same reasons as outlined above since Dahn does not disclose or remotely suggest every limitation of the independent claims. Accordingly, dependent claims 17 and 18 are patentably distinct in view of their dependencies from independent claims 21 and 22, respectively.

It is believed that all pending claims are now in condition for allowance. Applicants therefore respectfully request an early and favorable reconsideration and allowance of this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicants' representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY

Brian K. Seidleck
Registration No. 51,321

600 13th Street, N.W.
Washington, DC 20005-3096
(202) 756-8000 BKS:apr
Facsimile: (202) 756-8087
Date: January 8, 2004